THE PENDING CLAIMS:

1. (Previously Presented) A method for forming a ruthenium layer on a substrate, comprising:

positioning a substrate within a process chamber; and

exposing the substrate sequentially to a ruthenium-containing compound and a reducing gas during an atomic layer deposition process to form a ruthenium material on the substrate, wherein the ruthenium-containing compound is selected from the group consisting of bis(2,4-dimethylpentadienyl) ruthenium, (2,4-dimethylpentadienyl) ruthenium (cyclopentadienyl), (2,4-dimethylpentadienyl) ruthenium (methylcyclopentadienyl), (2,4-dimethylpentadienyl) ruthenium (ethylcyclopentadienyl), (2,4-dimethylpentadienyl) ruthenium (isopropylcyclopentadienyl), derivatives thereof, and combinations thereof.

2. (Previously Presented) The method of claim 1, wherein the process chamber is purged with a purge gas and a deposition cycle of the atomic layer deposition process includes sequentially delivering the ruthenium-containing compound, the purge gas, the reducing gas and the purge gas into the process chamber.

3. (Cancelled)

4. (Previously Presented) The method of claim 1, wherein the reducing gas comprises one or more gases selected from the group consisting of hydrogen, atomic hydrogen, ammonia, silane, disilane, dimethylsilane, methylsilane, ethylsilane, chlorosilane, dichlorosilane, hexachlorodisilane, borane, diborane, triborane, tetraborane, pentaborane, triethylborane, derivatives thereof, and combinations thereof.

5. (Previously Presented) The method of claim 4, wherein the substrate is heated to a temperature below about 400°C and the process chamber is pressurized to a pressure below about 80 Torr.

6. (Cancelled)

7. (Original) The method of claim 2, wherein the purge gas is selected from the group consisting of helium, argon, hydrogen, nitrogen, and combinations thereof.

8. (Previously Presented) The method of claim 5, wherein the ruthenium-containing compound is pulsed into the process chamber for a duration within a range from about 0.05 seconds to about 1.5 seconds.

9. (Previously Presented) The method of claim 8, wherein the reducing gas is pulsed into the process chamber for a duration within a range from about 0.1 seconds to about 2 seconds.

10. (Previously Presented) The method of claim 7, wherein the purge gas is pulsed into the process chamber for a duration within a range from about 0.07 seconds to about 1 second.

11. (Previously Presented) The method of claim 4, wherein the ruthenium material is formed having a thickness within a range from about 10 Å to about 100 Å.

12. (Cancelled)

13. (Previously Presented) The method of claim 1, wherein the ruthenium-containing compound is exposed to the substrate from an expanding channel.

14. (Previously Presented) A method for forming a ruthenium layer on a substrate, comprising:

positioning a substrate within a process chamber;

exposing the substrate to a carrier gas having a circular flow pattern; and

exposing the substrate sequentially to a ruthenium-containing compound to form a ruthenium material on the substrate, wherein the ruthenium-containing compound and